

FACT SHEET FOR NPDES PERMIT WA-002113-0

FACILITY NAME: City of Granite Falls Wastewater Treatment Plant

TABLE OF CONTENTS

INTRODUCTION	4
BACKGROUND INFORMATION	5
DESCRIPTION OF THE FACILITY	5
History.....	5
Collection System Status	5
Treatment Processes.....	5
Discharge Outfall	5
Residual Solids.....	5
PERMIT STATUS.....	7
SUMMARY OF COMPLIANCE WITH THE PREVIOUS PERMIT	7
Flow and Influent BOD/TSS Loading	7
Chlorine.....	7
Suspended Solids, Percent Removal.....	7
Metals.....	7
WASTEWATER CHARACTERIZATION	8
PROPOSED PERMIT LIMITATIONS.....	8
DESIGN CRITERIA	9
TECHNOLOGY-BASED EFFLUENT LIMITATIONS	9
SURFACE WATER QUALITY-BASED EFFLUENT LIMITATIONS	10
Numerical Criteria for the Protection of Aquatic Life.....	10
Numerical Criteria for the Protection of Human Health.....	10
Narrative Criteria	10
Antidegradation.....	10
Critical Conditions	11
Mixing Zones	11
Description of the Receiving Water.....	11
Surface Water Quality Criteria	11
Consideration of Surface Water Quality-Based Limits for Numeric Criteria	12
Whole Effluent Toxicity	17
Human Health	17
Sediment Quality	18
GROUND WATER QUALITY LIMITATIONS.....	18
COMPARISON OF EFFLUENT LIMITS WITH THE EXISTING PERMIT ISSUED FEBRUARY 10, 2000 AND MODIFIED DECEMBER 4, 2003	18
Anti-Backsliding.....	19
MONITORING REQUIREMENTS.....	19
LAB ACCREDITATION	20
OTHER PERMIT CONDITIONS	20
REPORTING AND RECORDKEEPING	20
PREVENTION OF FACILITY OVERLOADING	20

OPERATION AND MAINTENANCE (O&M).....	20
RESIDUAL SOLIDS HANDLING.....	20
PRETREATMENT	21
Federal and State Pretreatment Program Requirements	21
Wastewater Permit Required	21
Requirements for Routine Identification and Reporting of Industrial Users	22
Duty to Enforce Discharge Prohibitions	22
Support by the Department for Developing Partial Pretreatment Program by POTW	22
OUTFALL EVALUATION	22
GENERAL CONDITIONS	23
PERMIT ISSUANCE PROCEDURES	23
PERMIT MODIFICATIONS	23
RECOMMENDATION FOR PERMIT ISSUANCE	23
REFERENCES FOR TEXT AND APPENDICES.....	24
APPENDIX A—PUBLIC INVOLVEMENT INFORMATION.....	26
APPENDIX B—GLOSSARY	27
APPENDIX C—TECHNICAL CALCULATIONS.....	32
Applicable Water Quality Criteria.....	33
Ammonia Water Quality Criteria Calculation.....	34
Receiving Water Sample Results During Critical Conditions.....	35
Reasonable Potential Calculation.....	36
Reasonable Potential Calculation for Human Health Criteria.....	37
Calculation of pH of a Mixture of Two Flows.....	38
Effluent Data Summary Statistics – Ammonia.....	39
Effluent Data Summary Statistics – Cadmium	39
Effluent Data Summary Statistics – Copper	40
Effluent Data Summary Statistics – Mercury	40
Effluent Data Summary Statistics – Zinc.....	41
Effluent Data – Other Metals.....	41
Whole Effluent Toxicity Test Results.....	42
APPENDIX D—RESPONSE TO COMMENTS.....	43

INTRODUCTION

The Federal Clean Water Act (FCWA, 1972, and later modifications, 1977, 1981, and 1987) established water quality goals for the navigable (surface) waters of the United States. One of the mechanisms for achieving the goals of the Clean Water Act is the National Pollutant Discharge Elimination System of permits (NPDES permits), which is administered by the Environmental Protection Agency (EPA). The EPA has authorized the State of Washington to administer the NPDES permit program. Chapter 90.48 RCW defines the Department of Ecology's authority and obligations in administering the wastewater discharge permit program.

The regulations adopted by the State include procedures for issuing permits (Chapter 173-220 WAC), technical criteria for discharges from municipal wastewater treatment facilities (Chapter 173-221 WAC), water quality criteria for surface and ground waters (Chapters 173-201A and 200 WAC), and sediment management standards (Chapter 173-204 WAC). These regulations require that a permit be issued before discharge of wastewater to waters of the state is allowed. The regulations also establish the basis for effluent limitations and other requirements which are to be included in the permit. One of the requirements (WAC 173-220-060) for issuing a permit under the NPDES permit program is the preparation of a draft permit and an accompanying fact sheet. Public notice of the availability of the draft permit is required at least thirty (30) days before the permit is issued (WAC 173-220-050). The fact sheet and draft permit are available for review (see Appendix A—Public Involvement of the fact sheet for more detail on the public notice procedures).

The fact sheet and draft permit have been reviewed by the Permittee. Errors and omissions identified in this review have been corrected before going to public notice. After the public comment period has closed, the Department will summarize the substantive comments and the response to each comment. The summary and response to comments will become part of the file on the permit and parties submitting comments will receive a copy of the Department's response. The fact sheet will not be revised. Comments and the resultant changes to the permit will be summarized in Appendix D—Response to Comments.

GENERAL INFORMATION	
Applicant	City of Granite Falls
Facility Name and Address	City of Granite Falls Wastewater Treatment Plant 500 West Wallace Granite Falls, Washington 98252
Type of Treatment	Oxidation Ditch –Activated Sludge
Discharge Location	Pilchuck River Latitude: 48° 04' 32" N Longitude: 122° 58' 33" W
Water Body ID Number	WA-07-1030

BACKGROUND INFORMATION

DESCRIPTION OF THE FACILITY

HISTORY

The wastewater treatment plant was constructed in 1983 to provide secondary treatment for the City's domestic wastewater. In 1982 the storm sewer had been separated from the sanitary sewer. A composting facility was added to the plant in 1992 to allow more consistent control of sludge wasting. Plant improvements were constructed in 2003, including a new bioselector, new mixers in the oxidation ditch, splitter box, additional secondary clarifier, RAS and WAS pumps, and effluent reaeration/cooling tank, and ultraviolet disinfection. Installation of a mechanical fine screen to replace the existing comminutor unit is planned for 2004.

COLLECTION SYSTEM STATUS

The City provides sewer service mostly by a gravity collection system which conveys the community wastewater to the secondary treatment facility at the western edge of the City. The existing collection system has adequate capacity for the City's existing population and build-out conditions for the current service area. Future requirements for the collection system will depend on the residential and commercial growth occurring within the City's urban growth area, and will include gravity lines, pump stations, and force mains. Infiltration and inflow has been recorded as high as 30 percent of the influent and remains an on-going concern.

TREATMENT PROCESSES

The treatment process consists of sand and grit settling and screening at the headworks, followed by biological treatment in an oxidation ditch, clarification, and disinfection with ultraviolet light. See Figure 1 for the schematic for the existing treatment plant.

Operation of the treatment plant is performed by a 2.5 person operator crew working 8-hour shifts, 5 days a week, with 3 hours/day on weekends. The treatment plant is classified as Level II.

DISCHARGE OUTFALL

Secondary treated and disinfected effluent is discharged from the facility into the Pilchuck River. The outfall diffuser section is buried approximately one foot below the bottom of the river bed. The diffuser consists of an 18-foot section of ductile iron pipe with seventeen 2-inch diffusers spaced 24 inches apart on either side of the pipe. The diffusers extend 6 inches up from the river bed with their discharge directed downstream. An outfall inspection conducted in August and October 2003 indicated that some of the diffuser risers had apparently broken off or were covered in sediment.

RESIDUAL SOLIDS

The treatment facilities remove solids during the treatment of the wastewater at the headworks (grit and screenings), and at the secondary clarifiers, in addition to incidental solids (rags, scum, and other debris) removed as part of the routine maintenance of the equipment. Grit, rags, scum, and screenings are drained and disposed of as solid waste at the local landfill. Solids removed from the secondary clarifiers are treated by dewatering and composting. The finished compost is donated to local farmers. The composting operation is monitored by the Snohomish County Health District.

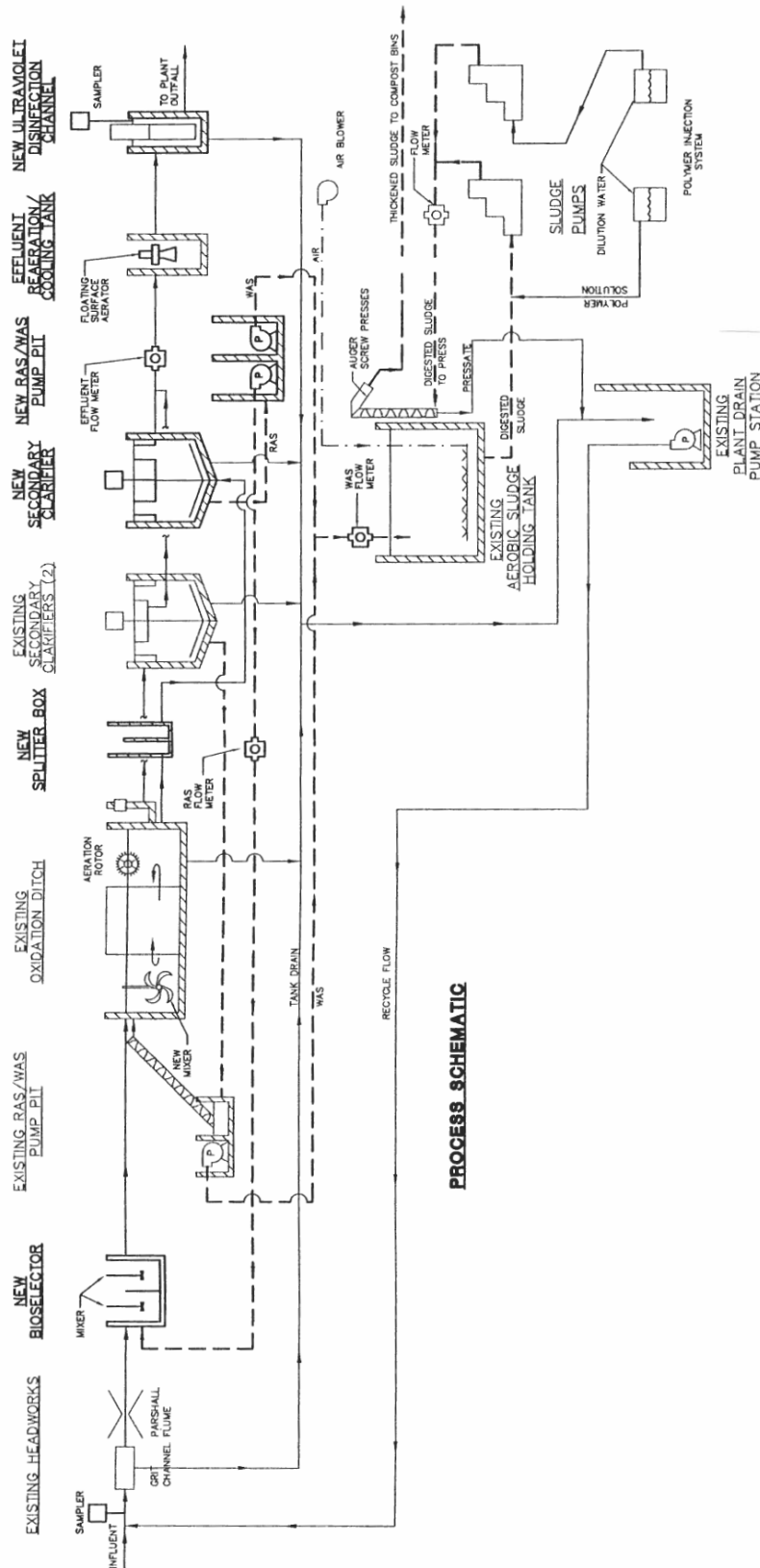


Figure 1.

PERMIT STATUS

The previous permit for this facility was issued on February 10, 2000. The previous permit placed effluent limitations on 5-day biochemical oxygen demand (BOD₅), total suspended solids (TSS), pH, fecal coliform bacteria, total residual chlorine, cadmium, copper, mercury, and zinc. A permit modification was issued December 4, 2003.

An application for permit renewal was submitted to the Department on December 31, 2003, and accepted by the Department on February 20, 2004.

SUMMARY OF COMPLIANCE WITH THE PREVIOUS PERMIT

The facility received its last compliance inspection on May 2, 2002. Operator outreach inspections were conducted on November 20, 2003 and May 7, 2004.

During the history of the previous permit, the Permittee has been out of compliance with several permit limits, as reported in their monthly discharge monitoring reports. These violations, the reasons for them and their resolutions fall into a few categories:

FLOW AND INFLUENT BOD/TSS LOADING

During 2002 and 2003, there were six violations of the design limit for flow, eighteen violations of the design limit for influent BOD₅, and three violations of the design limit for influent TSS. These violations were a result of population growth in the treatment plant's service area causing higher flows and loadings. Plant improvements constructed during 2003 increased the plant's capacity to treat these flows. The permit modification issued December 4, 2003, changed the design limits to reflect the plant's increased capacity.

CHLORINE

The Permittee reported nine violations of the limits for total residual chlorine during the previous permit. Granite Falls has now converted their disinfection system from chlorine to ultraviolet light and these limits have been removed from the permit.

SUSPENDED SOLIDS, PERCENT REMOVAL

The Permittee reported six violations of the requirement for removal of 85% of influent suspended solids during 2002 and 2003. This is usually caused by excessive inflow and infiltration (storm water and ground water) getting into the sanitary sewer system. The Permittee may address this problem by maintenance and repair of the collection system and improved efficiency at the treatment plant.

METALS

Over the life of the previous permit, the Permittee has reported one violation of the cadmium limit, four violations of the copper limit, three violations of the mercury limit, and 43 violations of the zinc limit. These limits were set in the previous permit based on very limited data and "best professional judgment." The City of Granite Falls and outside groups have done extensive research regarding the possible sources of metals in the collection system, the effects of zinc in the environment, and possible treatment options.

WASTEWATER CHARACTERIZATION

The concentration of pollutants in the discharge was reported in the NPDES application and in discharge monitoring reports. The effluent is characterized as follows:

Table 1: Wastewater Characterization Summary

<u>Parameter</u>	<u>Average Concentration</u>
Biochemical Oxygen Demand (BOD5)	11.1 mg/L
Fecal Coliform	32/100 mL
Total Suspended Solids (TSS)	11.2 mg/L
Ammonia (as N)	8.4 mg/L
Cadmium	0.09 µg/L
Copper	7.17 µg/L
Mercury	0.011 µg/L
Zinc	53.8 µg/L

Additional data describing the effluent may be found in Appendix C.

PROPOSED PERMIT LIMITATIONS

Federal and State regulations require that effluent limitations set forth in an NPDES permit must be either technology- or water quality-based. Technology-based limitations for municipal discharges are set by regulation (40 CFR 133, and Chapters 173-220 and 173-221 WAC). Water quality-based limitations are based upon compliance with the surface water quality standards (Chapter 173-201A WAC), ground water standards (Chapter 173-200 WAC), sediment quality standards (Chapter 173-204 WAC) or the National Toxics Rule (Federal Register, Volume 57, No. 246, Tuesday, December 22, 1992.) The most stringent of these types of limits must be chosen for each of the parameters of concern. Each of these types of limits is described in more detail below.

The limits in this permit are based in part on information received in the application. The effluent constituents in the application were evaluated on a technology- and water quality-basis. The limits necessary to meet the rules and regulations of the State of Washington were determined and included in this permit. Ecology does not develop effluent limits for all pollutants that may be reported on the application as present in the effluent. Some pollutants are not treatable at the concentrations reported, are not controllable at the source, are not listed in regulation, and do not have a reasonable potential to cause a water quality violation. Effluent limits are not always developed for pollutants that may be in the discharge but not reported as present in the application. In those circumstances, the permit does not authorize discharge of the non-reported pollutants. Effluent discharge conditions may change from the conditions reported in the permit application. If significant changes occur in any constituent, as described in 40 CFR 122.42(a), the Permittee is required to notify the Department of Ecology. The Permittee may be in violation of the permit until the permit is modified to reflect additional discharge of pollutants.

DESIGN CRITERIA

In accordance with WAC 173-220-150 (1)(g), flows or waste loadings shall not exceed approved design criteria.

The design criteria for this treatment facility are taken from the approved plans for the *City of Granite Falls Wastewater Treatment Facility Phase 1 Improvements* prepared by Gray & Osborne, Inc. and are as follows:

Table 2: Design Standards for Granite Falls WWTP.

Parameter	Design Quantity
Monthly average flow (max. month)	0.414 MGD
Peak hour flow	1.104 MGD
BOD ₅ influent loading	820 lb./day
TSS influent loading	691 lb./day
Ammonia influent loading	120 lb./day
Design population equivalent	2764

TECHNOLOGY-BASED EFFLUENT LIMITATIONS

Municipal wastewater treatment plants are a category of discharger for which technology-based effluent limits have been promulgated by federal and state regulations. These effluent limitations are given in the Code of Federal Regulations (CFR) 40 CFR Part 133 (federal) and in Chapter 173-221 WAC (state). These regulations are performance standards that constitute all known available and reasonable methods of prevention, control, and treatment for municipal wastewater.

The following technology-based limits for pH, fecal coliform, BOD₅, and TSS are taken from Chapter 173-221 WAC are:

Table 3: Technology-based Limits.

Parameter	Limit
pH:	shall be within the range of 6 to 9 standard units.
Fecal Coliform Bacteria	Monthly Geometric Mean = 200 organisms/100 mL Weekly Geometric Mean = 400 organisms/100 mL
BOD ₅ (concentration)	Average Monthly Limit is the most stringent of the following: - 30 mg/L - may not exceed fifteen percent (15%) of the average influent concentration Average Weekly Limit = 45 mg/L
TSS (concentration)	Average Monthly Limit is the most stringent of the following: - 30 mg/L - may not exceed fifteen percent (15%) of the average influent concentration Average Weekly Limit = 45 mg/L

The following technology-based mass limits are based on WAC 173-220-130(3)(b) and 173-221-030(11)(b).

Monthly effluent mass loadings (lbs/day) were calculated as the maximum monthly design flow (0.414 MGD) x concentration limit (30 mg/L) x 8.34 (conversion factor) = mass limit 104 lbs/day.

The weekly average effluent mass loading is calculated as 1.5 x monthly loading = 155 lbs/day.

SURFACE WATER QUALITY-BASED EFFLUENT LIMITATIONS

In order to protect existing water quality and preserve the designated beneficial uses of Washington's surface waters, WAC 173-201A-060 states that waste discharge permits shall be conditioned such that the discharge will meet established surface water quality standards. The Washington State surface water quality standards (Chapter 173-201A WAC) is a state regulation designed to protect the beneficial uses of the surface waters of the state. Water quality-based effluent limitations may be based on an individual waste load allocation (WLA) or on a WLA developed during a basin-wide total maximum daily loading study (TMDL).

NUMERICAL CRITERIA FOR THE PROTECTION OF AQUATIC LIFE

"Numerical" water quality criteria are numerical values set forth in the State of Washington's water quality standards for surface waters (Chapter 173-201A WAC). They specify the levels of pollutants allowed in a receiving water while remaining protective of aquatic life. Numerical criteria set forth in the water quality standards are used along with chemical and physical data for the waste water and receiving water to derive the effluent limits in the discharge permit. When surface water quality-based limits are more stringent or potentially more stringent than technology-based limitations, they must be used in a permit.

NUMERICAL CRITERIA FOR THE PROTECTION OF HUMAN HEALTH

The state was issued 91 numeric water quality criteria for the protection of human health by the U.S. EPA (EPA 1992). These criteria are designed to protect humans from cancer and other diseases and are primarily applicable to fish and shellfish consumption and drinking water from surface waters.

NARRATIVE CRITERIA

In addition to numerical criteria, "narrative" water quality criteria (WAC 173-201A-030) limit toxic, radioactive, or deleterious material concentrations below those which have the potential to adversely affect characteristic water uses, cause acute or chronic toxicity to biota, impair aesthetic values, or adversely affect human health. Narrative criteria protect the specific beneficial uses of all fresh (WAC 173-201A-130) and marine (WAC 173-201A-140) waters in the state of Washington.

ANTIDegradation

The State of Washington's Antidegradation Policy requires that discharges into a receiving water shall not further degrade the existing water quality of the water body. In cases where the natural conditions of a receiving water are of lower quality than the criteria assigned, the natural conditions shall constitute the water quality criteria. Similarly, when receiving waters are of higher quality than the criteria assigned, the existing water quality shall be protected. More information on the State Antidegradation Policy can be obtained by referring to WAC 173-201A-070.

FACILITY NAME: GRANITE FALLS WWTP

The Department has reviewed existing records and has determined that ambient water quality in the vicinity of the discharge is meeting the designated classification criteria given in Chapter 173-201A WAC, except for the human health criterion for arsenic. Therefore, the Department will use the designated classification criteria for this water body in the proposed permit and the natural background level of arsenic as the human health criterion. The discharges authorized by this proposed permit should not cause a loss of beneficial uses.

CRITICAL CONDITIONS

Surface water quality-based limits are derived for the waterbody's critical condition, which represents the receiving water and waste discharge condition with the highest potential for adverse impact on the aquatic biota, human health, and existing or characteristic waterbody uses.

MIXING ZONES

The water quality standards allow the Department of Ecology to authorize mixing zones around a point of discharge in establishing surface water quality-based effluent limits. Both "acute" and "chronic" mixing zones may be authorized for pollutants that can have a toxic effect on the aquatic environment near the point of discharge. The concentration of pollutants at the boundary of these mixing zones may not exceed the numerical criteria for that type of zone. Mixing zones can only be authorized for discharges that are receiving all known available and reasonable methods of prevention, control and treatment (AKART) and in accordance with other mixing zone requirements of WAC 173-201A-100.

The National Toxics Rule (EPA, 1992) allows the chronic mixing zone to be used to meet human health criteria.

DESCRIPTION OF THE RECEIVING WATER

The facility discharges to the Pilchuck River which is designated as a Class A receiving water in the vicinity of the outfall. Characteristic uses include the following:

water supply (domestic, industrial, agricultural); stock watering; fish migration; fish rearing, spawning and harvesting; wildlife habitat; primary contact recreation; sport fishing; boating and aesthetic enjoyment; commerce and navigation.

Water quality of this class shall meet or exceed the requirements for all or substantially all uses.

The Pilchuck River originates approximately 15 miles southeast of Granite Falls on the western slopes of the Cascade Mountains. The river flows northwesterly toward Granite Falls, then flows southwesterly to join the Snohomish River southeast of the city of Snohomish. The city of Snohomish obtains its water supply from the Pilchuck River through a diversion upstream from Granite Falls. This withdrawal averages about 0.5 million gallons per day (MGD).

SURFACE WATER QUALITY CRITERIA

Applicable criteria are defined in Chapter 173-201A WAC for aquatic biota. In addition, U.S. EPA has promulgated human health criteria for toxic pollutants (EPA 1992). Criteria for this discharge are summarized below:

FACILITY NAME: GRANITE FALLS WWTP

Fecal Coliforms	Fecal coliform organism levels shall both not exceed a geometric mean value of 100 organisms/100 mL, and not have more than 10 percent of all samples obtained for calculating the geometric mean value exceeding 200 colonies/100 mL.
Dissolved Oxygen	Shall exceed 8 mg/L.
Temperature	Shall not exceed 18 degrees Celsius due to human activities. When natural conditions exceed 18.0° C, no temperature increases will be allowed which will raise the receiving water temperature by greater than 0.3° C.
pH	Shall be within the range of 6.5 to 8.5 with a human-caused variation within the above range of less than 0.5 units.
Turbidity	Shall not exceed 5 NTU over background turbidity when the background turbidity is 50 NTU or less, or have more than a 10 percent increase in turbidity when the background turbidity is more than 50 NTU.
Toxics	Toxic, radioactive, or deleterious material concentrations shall be below those which have the potential either singularly or cumulatively to adversely affect characteristic water uses, cause acute or chronic conditions to the most sensitive biota dependent upon those waters, or adversely affect public health, as determined by the department. (see Appendix C for numeric criteria for toxics of concern for this discharge)

The Pilchuck River is included on the 1998 303(d) list for exceeding standards for fecal coliform and temperature. The Granite Falls discharge is more than six miles upstream from the segments of the river on the 303(d) list. The section of the river where the treatment plant is located has been meeting water quality standards. The sources of the problems appear to be livestock access to the stream, inadequate pasture management, on-site sewage disposal systems, and improper fertilizer application. The Snohomish River Tributaries Fecal Coliform TMDL, approved by the EPA on August 9, 2001, was developed to address these problems.

CONSIDERATION OF SURFACE WATER QUALITY-BASED LIMITS FOR NUMERIC CRITERIA

Pollutant concentrations in the proposed discharge may exceed water quality criteria with technology-based controls which the Department has determined to be AKART. The water quality standards allow the use of mixing zones for discharges that would otherwise exceed the water quality criteria for aquatic life. The requirements for mixing zones are described in WAC 173-201A-100.

The maximum boundaries of the mixing zones are defined as follows:

1. The zone of chronic criteria exceedance, singularly or in combination with other zones, shall comply with the most restrictive combination of the following:
 - a. Not extend in a downstream direction from the discharge port(s) greater than three hundred feet plus the depth of water over the discharge port(s) or extend upstream for a distance of over one hundred feet;
 - b. Not utilize greater than twenty-five percent of the flow; and
 - c. Not occupy greater than twenty-five percent of the width of the water body.
2. The zone of acute criteria exceedance, singularly or in combination with other mixing zones, shall comply with the most restrictive combination of the following:
 - a. Not extend beyond ten percent of the distance to the chronic mixing zone boundary described above, as measured independently from the discharge port(s);
 - b. Not utilize greater than two and one-half percent of the flow; and
 - c. Not occupy greater than twenty-five percent of the width of the water body.
3. The vertical limitation for both chronic and acute zones is the depth of the river at the outfall location at 7Q10.

Exceptions to the numeric size criteria for mixing zones are allowed by WAC 173-201A-100(12) in cases where the discharge existed prior to November 24, 1992, and where the exceedance is clearly necessary to accommodate important economic or social development in the area in which the waters are located. Before such an exception may be allowed, it must clearly be demonstrated that:

1. AKART appropriate to the discharge is being fully applied;
2. All siting, technological, and managerial options which would result in full or significantly closer compliance that are economically achievable are being utilized; and
3. Supporting information clearly indicates the mixing zone would not have a reasonable potential to cause a loss of sensitive or important habitat, substantially interfere with the existing or characteristic uses of the water body, result in damage to the ecosystem, or adversely affect public health as determined by the department.

Granite Falls's outfall was constructed in 1980, and consists of seventeen diffuser ports spread over a distance of sixteen feet. Sixteen feet is greater than 25 percent of the width of the Pilchuck River at low flow. The dilution factors corresponding to 25 percent of river flow for the chronic zone and 2.5 percent of river flow for the acute zone are very low. Use of these dilution factors would result in effluent limits for metals with which the Permittee is unable to comply. Granite Falls has requested an exception to the numeric mixing zone size criteria according to WAC 173-201A-100(12).

The Department of Ecology has determined that the requirements for an exception to the percent of flow limitations and the percent of river width limitations have been met.

1. AKART appropriate to the discharge is being fully applied. AKART (all known available and reasonable methods of treatment) for domestic wastewater facilities has been defined explicitly as effluent limitations for the parameters of BOD, TSS, pH, and fecal coliform in Chapter 173-221 WAC. These limitations have been implemented in permits and complied with by the Permittee since 1983. More recently, upgrades to the treatment plant have improved its effluent quality by further reducing solids and turbidity, eliminating the use of chlorine for disinfection, and installing the capacity to cool and aerate the effluent.
2. All siting, technological, and managerial options which would result in full or significantly closer compliance that are economically achievable are being utilized. Improvements to the treatment plant have recently been constructed, as described above. The City has also completed two sewer system studies to determine the sources of zinc in the wastewater. No sewer reaches were identified as consistently containing elevated levels of zinc, and no industrial or commercial sources of elevated zinc concentrations were found. Some accumulated sediments in manholes may be contaminated with zinc. The sources of zinc and copper in the Granite Falls sewer system are primarily non-point and domestic, and are thus extremely difficult to control. According to studies surveyed by the Sustainable Fisheries Foundation (*Wastewater Treatment Methods for Zinc*, 2004), secondary treatment removes an average of 55% of zinc. Further removal by installing additional treatment such as electrocoagulation or by land application of the effluent would be extremely costly to the City. The City has estimated the capital costs of these treatment options to be one to two million dollars, with operating costs estimated to cause a rate increase of \$17/month per household.
3. Supporting information clearly indicates the mixing zone would not have a reasonable potential to cause a loss of sensitive or important habitat, substantially interfere with the existing or characteristic uses of the water body, result in damage to the ecosystem, or adversely affect public health as determined by the Department. Ecology relies primarily on compliance with the water quality standards to assure that discharges do not interfere with beneficial uses including salmonid migration. There is no reasonable potential for water quality standards to be violated for zinc or any other parameter outside a mixing zone measured 30 feet downstream from the discharge for acute aquatic-life standards and 300 feet downstream for chronic aquatic-life standards. Whole effluent toxicity testing has shown no toxicity to sensitive test organisms.

A mixing zone study for the Granite Falls discharge was done by Cosmopolitan Engineering Group in 1996. The mixing zone study used a model (a variation of the model RIVPLUME called FSCHR2D) to determine dilution factors for 300 feet and 30 feet downstream of the diffuser. For the year 2005 maximum month design flow, these dilution factors are 39.4 and 15.1.

	Acute	Chronic
Aquatic Life	15.1	39.4
Human Health, Carcinogen		39.4
Human Health, Noncarcinogen		39.4

Exemptions granted to the size criteria must be reexamined during each permit renewal period for changes in compliance capability. Any significant increase in capability to comply shall be reflected in the next permit renewal (WAC 173-201A-100(14)). Before any future expansion of the treatment plant or modifications to the diffuser, the mixing zone study should be redone.

Pollutants in an effluent may affect the aquatic environment near the point of discharge (near-field) or at a considerable distance from the point of discharge (far-field). Toxic pollutants, for example, are near-field pollutants—their adverse effects diminish rapidly with mixing in the receiving water. Conversely, a pollutant such as BOD is a far-field pollutant whose adverse effect occurs away from the discharge even after dilution has occurred. Thus, the method of calculating water quality-based effluent limits varies with the point at which the pollutant has its maximum effect.

The derivation of water quality-based limits also takes into account the variability of the pollutant concentrations in both the effluent and the receiving water.

The most critical period for water quality in the Pilchuck River occurs during periods of low stream flow in late summer. The USGS gauging station located on the river at Granite Falls indicates the 10-year, 7-day low flow for the river is 30.3 cubic feet per second (cfs) or 19.4 MGD. This design flow represents the average minimum flow for seven consecutive days that has a recurrence interval of once in ten years.

The ambient background data used for this permit includes dry season data (August and October) from the Effluent and Receiving Water Study (Gray & Osborne, Inc., 2004).

Parameter	Value used
7Q10 low flow	30.3 cfs (USGS data)
Temperature (max)	17.4 °C
pH	7.4
Dissolved Oxygen (min)	10.6 mg/L
Hardness	36 mg/L as CaCO ₃
Ammonia	0.0 (below detection limit; from TMDL study)
Arsenic	1.1 µg/L
Cadmium	0.0 (below detection limit)
Chromium	0.8 µg/L
Copper	0.5 µg/L
Lead	0.02 µg/L
Nickel	1.6 µg/L
Silver	0.0 (below detection limit)
Zinc	0.0 (below detection limit)
Mercury	0.0006 µg/L

The impacts of dissolved oxygen deficiency, temperature, pH, fecal coliform, chlorine, ammonia, metals, and other toxics were determined as shown below, using the dilution factors described above.

FACILITY NAME: GRANITE FALLS WWTP

BOD₅—Under critical conditions there is no predicted violation of the water quality standards for surface waters. Therefore, the technology-based effluent limitations for BOD₅ were placed in the permit.

The impact of BOD on the receiving water was modeled using a Streeter-Phelps analysis of dissolved oxygen sag, at critical conditions and with the technology-based effluent limitation for BOD₅ described under "Technology-Based Effluent Limitations" above. The calculations used to determine dissolved oxygen impacts are shown in Appendix C. Additional input values were taken from the corresponding analysis in the mixing zone study (1996).

Temperature and pH—The impact of pH and temperature were modeled using the calculations from EPA, 1988. Under critical conditions, there is no predicted violation of the water quality standards for surface waters. Calculations are shown in Appendix C. In addition, Granite Falls has recently installed a spray aeration cooling system which is expected to decrease the effluent temperature by approximately one degree and increase the dissolved oxygen from approximately 4 mg/L to 6 mg/L. Therefore, the technology-based effluent limitations for pH were placed in the permit, and temperature was not limited.

Fecal Coliform—The numbers of fecal coliform were modeled by simple mixing analysis using the technology-based limit of 400 organisms per 100 ml and a dilution factor of 39.4. Under critical conditions, there is no predicted violation of the water quality standards for surface waters with the technology-based limit. Therefore, the technology-based effluent limitations for fecal coliform bacteria were placed in the proposed permit.

Toxic Pollutants—Federal regulations (40 CFR 122.44) require NPDES permits to contain effluent limits for toxic chemicals in an effluent whenever there is a reasonable potential for those chemicals to exceed the surface water quality criteria. This process occurs concurrently with the derivation of technology-based effluent limits. Facilities with technology-based effluent limits defined in regulation are not exempted from meeting the water quality standards for surface waters or from having surface water quality-based effluent limits.

The following toxics were determined to be present in the discharge: ammonia, arsenic, cadmium, chromium, copper, lead, nickel, silver, zinc, and mercury. A reasonable potential analysis (see Appendix C) was conducted on these parameters to determine whether or not effluent limitations would be required in this permit.

The determination of the reasonable potential for the toxic chemicals listed above to exceed the water quality criteria was evaluated with procedures given in EPA, 1991 (Appendix C) at the critical condition. The critical condition in this case occurs at low river flow (7Q10). Valid ambient background data was available for all the pollutants of concern. Calculations using all applicable data resulted in a determination that there is no reasonable potential for this discharge to cause a violation of water quality standards. This determination assumes that the Permittee meets the other effluent limits of this permit.

WHOLE EFFLUENT TOXICITY

The water quality standards for surface waters require that the effluent not cause toxic effects in the receiving waters. Many toxic pollutants cannot be detected by commonly available detection methods. However, toxicity can be measured directly by exposing living organisms to the waste water in laboratory tests and measuring the response of the organisms. Toxicity tests measure the aggregate toxicity of the whole effluent, and therefore this approach is called whole effluent toxicity (WET) testing. Some WET tests measure acute toxicity and other WET tests measure chronic toxicity.

Acute toxicity tests measure mortality as the significant response to the toxicity of the effluent. Dischargers who monitor their waste water with acute toxicity tests are providing an indication of the potential lethal effect of the effluent to organisms in the receiving environment.

Chronic toxicity tests measure various sublethal toxic responses such as retarded growth or reduced reproduction. Chronic toxicity tests often involve either a complete life cycle test of an organism with an extremely short life cycle or a partial life cycle test on a critical stage of one of a test organism's life cycles. Organism survival is also measured in some chronic toxicity tests.

Accredited WET testing laboratories have the proper WET testing protocols, data requirements, and reporting format. Accredited laboratories are knowledgeable about WET testing and capable of calculating an NOEC, LC₅₀, EC₅₀, IC₂₅, etc. All accredited labs have been provided the most recent version of the Department of Ecology Publication # WQ-R-95-80, *Laboratory Guidance and Whole Effluent Toxicity Test Review Criteria*, which is referenced in the permit. Any Permittee interested in receiving a copy of this publication may call the Ecology Publications Distribution Center (360-407-7472) for a copy. Ecology recommends that Permittees send a copy of the acute or chronic toxicity sections(s) of their permits to their laboratory of choice.

The WET tests during effluent characterization indicate that no reasonable potential exists to cause receiving water acute toxicity or receiving water chronic toxicity, and the Permittee will not be given an acute or chronic WET limit and will only be required to retest the effluent prior to application for permit renewal in order to demonstrate that acute or chronic toxicity has not increased in the effluent.

If the Permittee makes process or material changes which, in the Department's opinion, results in an increased potential for effluent toxicity, then the Department may require additional effluent characterization in a regulatory order, by permit modification, or in the permit renewal. Toxicity is assumed to have increased if WET testing conducted for submission with a permit application fails to meet the performance standards in WAC 173-205-020, "whole effluent toxicity performance standard." The Permittee may demonstrate to the Department that changes have not increased effluent toxicity by performing additional WET testing after the time the process or material changes have been made.

HUMAN HEALTH

Washington's water quality standards now include 91 numeric health-based criteria that must be considered in NPDES permits. These criteria were promulgated for the state by the U.S. EPA in its National Toxics Rule (Federal Register, Volume 57, No. 246, Tuesday, December 22, 1992).

The Department has determined that the effluent is likely to have chemicals of concern for human health. The discharger's high priority status is based on knowledge of data indicating regulated chemicals occur in the discharge.

A determination of the discharge's potential to cause an exceedance of the water quality standards was conducted as required by 40 CFR 122.44(d). The reasonable potential determination was evaluated with procedures given in the *Technical Support Document for Water Quality-Based Toxics Control* (EPA/505/2-90-001) and the Department's *Permit Writer's Manual* (Ecology Publication 92-109, July 1994). The determination indicated that the discharge has no reasonable potential to cause a violation of water quality standards, thus an effluent limit is not warranted.

SEDIMENT QUALITY

The Department has promulgated aquatic sediment standards (Chapter 173-204 WAC) to protect aquatic biota and human health. These standards state that the Department may require Permittees to evaluate the potential for the discharge to cause a violation of applicable standards (WAC 173-204-400).

The Department has determined through a review of the discharger characteristics and effluent characteristics that this discharge has no reasonable potential to violate the sediment management standards.

GROUND WATER QUALITY LIMITATIONS

The Department has promulgated ground water quality standards (Chapter 173-200 WAC) to protect uses of ground water. Permits issued by the Department shall be conditioned in such a manner so as not to allow violations of those standards (WAC 173-200-100).

This Permittee has no discharge to ground and therefore no limitations are required based on potential effects to ground water.

COMPARISON OF EFFLUENT LIMITS WITH THE EXISTING PERMIT ISSUED FEBRUARY 10, 2000, AND MODIFIED DECEMBER 4, 2003

Parameter	Existing Limits	Proposed Limits
Biochemical Oxygen Demand (5-day) – Average Monthly	30 mg/L, 104 lbs/day	30 mg/L, 104 lbs/day
Biochemical Oxygen Demand (5-day) – Average Weekly	45 mg/L, 155 lbs/day	45 mg/L, 155 lbs/day
Total Suspended Solids – Average Monthly	30 mg/L, 104 lbs/day	30 mg/L, 104 lbs/day
Total Suspended Solids – Average Weekly	45 mg/L, 155 lbs/day	45 mg/L, 155 lbs/day
Fecal Coliform Bacteria – Average Monthly	200/100 mL	200/100 mL
Fecal Coliform Bacteria – Average Weekly	400/100 mL	400/100 mL
pH - Daily Minimum and Maximum	6 - 9	6 - 9
Cadmium, Daily Maximum	5 µg/L	No limit
Copper, Daily Maximum	30 µg/L	No limit
Mercury, Daily Maximum	1 µg/L	No limit
Zinc, Daily Maximum	120 µg/L	No limit

ANTI-BACKSLIDING

The exceptions to the anti-backsliding provision are listed in 40 CFR 122.44(l). Two of these exceptions apply in this case:

1. “Information is available which was not available at the time of permit issuance (other than revised regulations, guidance, or test methods) and which would have justified the application of a less stringent effluent limitation at the time of permit issuance”
(40 CFR 122.44(l)(B)(1))

Information which was not available at the time of the last permit issuance includes three years of weekly effluent testing for cadmium, copper, mercury, and zinc. If this data had been available, less stringent performance-based effluent limits would have been calculated. Insufficient data was available to calculate water quality-based limits. Additional information available now also includes the *Wastewater Treatment Plant Effluent and Receiving Water Study* (Gray & Osborne, Inc., April 2004), the *Granite Falls Wastewater Treatment Plant Expansion Biological Evaluation* (Adolfson Associates, Inc., January 2001), *Impacts of Elevated Zinc Concentrations on Salmonids* (Sustainable Fisheries Foundation, May 2004) and *Wastewater Treatment Methods for Zinc* (Sustainable Fisheries Foundation, May 2004). These documents were consulted in determining the reasonable potential for violations of the water quality standards, the potential effects of the mixing zone, and the reasonably available remedies.

2. “A less stringent effluent limitation is necessary because of events over which the permittee has no control and for which there is no reasonably available remedy”
(40 CFR 122.44(l)(C))

The treatment plant, a secondary biological system, has no ability to control the levels of zinc or other metals in its influent and effluent. The studies listed above found that zinc and copper enter the wastewater system primarily through non-point domestic sources and are exceptionally difficult to control. Advanced treatment methods to remove low level metals from waste water are not economically reasonable to implement.

MONITORING REQUIREMENTS

Monitoring, recording, and reporting are required (WAC 173-220-210 and 40 CFR 122.41) to verify that the treatment process is functioning correctly and the effluent limitations are being achieved.

Monitoring for ammonia, copper, and zinc is being required to further characterize the effluent. Continued data gathering on these pollutants is needed to demonstrate that they are not increasing and for reevaluation of the mixing zone exemption during the next permit renewal.

Monitoring of sludge quantity and quality is necessary to determine the appropriate uses of the sludge. Sludge monitoring is required by the current state and local solid waste management program and also by EPA under 40 CFR 503.

FACILITY NAME: GRANITE FALLS WWTP

The monitoring schedule is detailed in the proposed permit under Condition S2. Specified monitoring frequencies take into account the quantity and variability of discharge, the treatment method, past compliance, significance of pollutants, and cost of monitoring. The required monitoring frequency is consistent with agency guidance given in the current version of Ecology's *Permit Writer's Manual* (July 1994) for oxidation ditches.

LAB ACCREDITATION

With the exception of certain parameters, the permit requires all monitoring data to be prepared by a laboratory registered or accredited under the provisions of Chapter 173-50 WAC, *Accreditation of Environmental Laboratories*. The laboratory at this facility is accredited for BOD, TSS, dissolved oxygen, pH, and fecal coliform.

OTHER PERMIT CONDITIONS

REPORTING AND RECORDKEEPING

The conditions of S3 are based on the authority to specify any appropriate reporting and recordkeeping requirements to prevent and control waste discharges (WAC 173-220-210).

PREVENTION OF FACILITY OVERLOADING

Overloading of the treatment plant is a violation of the terms and conditions of the permit. To prevent this from occurring, RCW 90.48.110 and WAC 173-220-150 require the Permittee to take the actions detailed in proposed permit requirement S.4 to plan expansions or modifications before existing capacity is reached and to report and correct conditions that could result in new or increased discharges of pollutants. Condition S.4 restricts the amount of flow.

OPERATION AND MAINTENANCE (O&M)

The proposed permit contains Condition S.5, as authorized under RCW 90.48.110, WAC 173-220-150, Chapter 173-230 WAC, and WAC 173-240-080. It is included to ensure proper operation and regular maintenance of equipment, and to ensure that adequate safeguards are taken so that constructed facilities are used to their optimum potential in terms of pollutant capture and treatment.

RESIDUAL SOLIDS HANDLING

To prevent water quality problems, the Permittee is required in permit Condition S7 to store and handle all residual solids (grit, screenings, scum, sludge, and other solid waste) in accordance with the requirements of RCW 90.48.080 and State water quality standards.

The final use and disposal of sewage sludge from this facility is regulated by U.S. EPA under 40 CFR 503, and by Ecology under Chapter 70.95J RCW and Chapter 173-308 WAC. The disposal of other solid waste is under the jurisdiction of the Snohomish County Health Department.

PRETREATMENT

Federal and State Pretreatment Program Requirements

Under the terms of the addendum to the “Memorandum of Understanding between Washington Department of Ecology and the United States Environmental Protection Agency, Region 10” (1986), the Department of Ecology (Department) has been delegated authority to administer the Pretreatment Program (i.e., act as the Approval Authority for oversight of delegated Publicly Owned Treatment Works [POTWs]). Under this delegation of authority, the Department has exercised the option of issuing wastewater discharge permits for significant industrial users discharging to POTWs which have not been delegated authority to issue wastewater discharge permits.

There are a number of functions required by the Pretreatment Program which the Department is delegating to such POTWs because they are in a better position to implement the requirements (e.g. tracking the number and general nature of industrial dischargers to the sewerage system). The requirements for a Pretreatment Program are contained in Title 40, Part 403 of the Code of Federal Regulations. Under the requirements of the Pretreatment Program [40 CFR 403.8(f)(1)(iii)], the Department is required to approve, condition, or deny new discharges or a significant increase in the discharge for existing significant industrial users (SIUs) [40 CFR 403.8 (f)(1)(i)].

The Department is responsible for issuing State Waste Discharge Permits to SIUs and other industrial users of the Permittee's sewer system. Industrial dischargers must obtain these permits from the Department prior to the Permittee accepting the discharge [WAC 173-216-110(5)]. (Industries discharging wastewater that is similar in character to domestic waste water are not required to obtain a permit. Such dischargers should contact the Department to determine if a permit is required.) Industrial dischargers need to apply for a State Waste Discharge Permit sixty (60) days prior to commencing discharge. The conditions contained in the permits will include any applicable conditions for categorical discharges, loading limitations included in contracts with the POTW, and other conditions necessary to assure compliance with State water quality standards and biosolids standards.

The Department requires this POTW to fulfill some of the functions required for the Pretreatment Program in the NPDES permit (e.g. tracking the number and general nature of industrial dischargers to the sewage system). The POTW's NPDES permit will require that all SIUs currently discharging to the POTW be identified and notified of the requirement to apply for a wastewater discharge permit from the Department. None of the obligations imposed on the POTW relieve an industrial or commercial discharger of its primary responsibility for obtaining a wastewater discharge permit (if required), including submittal of engineering reports prior to construction or modification of facilities [40 CFR 403.12(j) and WAC 173-216-070 and WAC 173-240-110, et seq.].

Wastewater Permit Required

RCW 90.48 and WAC 173-216-040 require SIUs to obtain a permit prior to discharge of industrial waste to the Permittee's sewerage system. This provision prohibits the POTW from accepting industrial wastewater from any such dischargers without authorization from the Department.

Requirements for Routine Identification and Reporting of Industrial Users

The NPDES permit requires nondelegated POTWs to "take continuous, routine measures to identify all existing, new, and proposed SIUs and potential significant industrial users (PSIUs) discharging to the Permittee's sewerage system." Examples of such routine measures include regular review of business tax licenses for existing businesses and review of water billing records and existing connection authorization records. System maintenance personnel can also be diligent during performance of their jobs in identifying and reporting as-yet unidentified industrial dischargers. Local newspapers, telephone directories, and word-of-mouth can also be important sources of information regarding new or existing discharges. The POTW is required to notify an industrial discharger, in writing, of their responsibilities regarding application for a State waste discharge permit and to send a copy of the written notification to the Department. The Department will then take steps to solicit a State waste discharge permit application.

Duty to Enforce Discharge Prohibitions

This provision prohibits the POTW from authorizing or permitting an industrial discharger to discharge certain types of waste into the sanitary sewer. The first portion of the provision prohibits acceptance of pollutants which cause pass-through or interference. The definitions of pass-through and interference are in Appendix B of the fact sheet.

The second portion of this provision prohibits the POTW from accepting certain specific types of wastes, namely those which are explosive, flammable, excessively acidic, basic, otherwise corrosive, or obstructive to the system. In addition, wastes with excessive BOD, petroleum-based oils, or which result in toxic gases are prohibited to be discharged. The regulatory basis for these prohibitions is 40 CFR Part 403, with the exception of the pH provisions which are based on WAC 173-216-060.

The third portion of this provision prohibits certain types of discharges unless the POTW receives prior authorization from the Department. The discharges include cooling water in significant volumes, storm water and other direct inflow sources, and waste waters significantly affecting system hydraulic loading, which do not require treatment.

Support by the Department for Developing Partial Pretreatment Program by POTW

The Department has committed to providing technical and legal assistance to the Permittee in fulfilling these joint obligations, in particular, assistance with developing an adequate sewer use ordinance, notification procedures, enforcement guidelines, and developing local limits and inspection procedures.

OUTFALL EVALUATION

Proposed permit Condition S.10 requires the Permittee to conduct an annual outfall inspection and submit a report detailing the findings of that inspection. The purpose of the inspection is to determine the condition of the discharge pipe and diffusers and to determine if sediment is accumulating in the vicinity of the outfall.

FACILITY NAME: GRANITE FALLS WWTP

GENERAL CONDITIONS

General Conditions are based directly on state and federal law and regulations and have been standardized for all individual municipal NPDES permits issued by the Department.

PERMIT ISSUANCE PROCEDURES

PERMIT MODIFICATIONS

The Department may modify this permit to impose numerical limitations, if necessary, to meet water quality standards, sediment quality standards, or ground water standards, based on new information obtained from sources such as inspections, effluent monitoring, outfall studies, and effluent mixing studies.

The Department may also modify this permit as a result of new or amended state or federal regulations.

RECOMMENDATION FOR PERMIT ISSUANCE

This proposed permit meets all statutory requirements for authorizing a wastewater discharge, including those limitations and conditions believed necessary to protect human health, aquatic life, and the beneficial uses of waters of the state of Washington. The Department proposes that this permit be issued for five (5) years.

REFERENCES FOR TEXT AND APPENDICES

Adolfson Associates, Inc.

2001. Granite Falls Wastewater Treatment Plant Expansion – Biological Evaluation, For Coordination with National Marine Fisheries Service and United States Fish and Wildlife Service.

Environmental Protection Agency (EPA)

1992. National Toxics Rule. Federal Register, V. 57, No. 246, Tuesday, December 22, 1992.
1991. Technical Support Document for Water Quality-based Toxics Control. EPA/505/2-90-001.
1988. Technical Guidance on Supplementary Stream Design Conditions for Steady State Modeling. USEPA Office of Water, Washington, D.C.
1985. Water Quality Assessment: A Screening Procedure for Toxic and Conventional Pollutants in Surface and Ground Water. EPA/600/6-85/002a.
1983. Water Quality Standards Handbook. USEPA Office of Water, Washington, D.C.

Gray & Osborne, Inc.

2004. City of Granite Falls Wastewater Treatment Plant Effluent and Receiving Water Study. G & O No. 03606.
1998. City of Granite Falls Sewer System Comprehensive Plan and Facilities Study. G & O No. 95763.

Metcalf and Eddy.

1991. Wastewater Engineering, Treatment, Disposal, and Reuse. Third Edition.

Snohomish County Surface Water Management.

Ambient Stream Water Quality Monitoring Program
(<http://www.co.snohomish.wa.us/publicwk/swm/WQ/StreamWQ.htm>)

Sustainable Fisheries Foundation.

2004. Impacts of Elevated Zinc Concentrations on Salmonids.
2004. Wastewater Treatment Methods for Zinc.

Tsivoglou, E.C., and J.R. Wallace.

1972. Characterization of Stream Reaeration Capacity. EPA-R3-72-012. (Cited in EPA 1985 op.cit.)

Tulalip Tribes Natural Resource Department.

2003. Habitat Conditions and Chinook Use in the Pilchuck River. Number 03-04.

FACILITY NAME: GRANITE FALLS WWTP

Washington State Department of Ecology.

Laws and Regulations (<http://www.ecy.wa.gov/laws-rules/index.html>)

Permit and Wastewater Related Information

(<http://www.ecy.wa.gov/programs/wq/wastewater/index.html>)

Water Quality Assessment (<http://www.ecy.wa.gov/programs/wq/303d/index.html>)

Washington State Department of Ecology.

2001. Snohomish River Tributaries Fecal Coliform Total Maximum Daily Load – Submittal Report. Publication Number 00-10-087.

1998. Criteria for Sewage Works Design (“Orange Book”). Publication Number 98-37 WQ.

1997. Water Quality Assessment of Tributaries to the Snohomish River and Nonpoint Source Pollution TMDL Study. Publication Number 97-334.

1994. Permit Writer’s Manual. Publication Number 92-109.

1986. Granite Falls Receiving Water Survey. Publication Number 86-e00.

Wright, R.M., and A.J. McDonnell.

1979. In-stream Deoxygenation Rate Prediction. Journal Environmental Engineering Division, ASCE. 105(E2). (Cited in EPA 1985 op.cit.)

APPENDIX A—PUBLIC INVOLVEMENT INFORMATION

The Department has tentatively determined to reissue a permit to the applicant listed on page one of this fact sheet. The permit contains conditions and effluent limitations which are described in the rest of this fact sheet.

Public Notice of Application (PNOA) was published on March 1 and March 8, 2004 in *The Everett Herald* to inform the public that an application had been submitted and to invite comment on the reissuance of this permit.

The Department will publish a Public Notice of Draft (PNOD) on date, in name of publication to inform the public that a draft permit and fact sheet are available for review. Interested persons are invited to submit written comments regarding the draft permit. The draft permit, fact sheet, and related documents are available for inspection and copying between the hours of 8:00 a.m. and 5:00 p.m. weekdays, by appointment, at the regional office listed below. Written comments should be mailed to:

Water Quality Permit Coordinator
Department of Ecology
Northwest Regional Office
3190 160th Avenue SE
Bellevue, WA 98008.

Any interested party may comment on the draft permit or request a public hearing on this draft permit within the thirty (30)-day comment period to the address above. The request for a hearing shall indicate the interest of the party and the reasons why the hearing is warranted. The Department will hold a hearing if it determines there is a significant public interest in the draft permit (WAC 173-220-090). Public notice regarding any hearing will be circulated at least thirty (30) days in advance of the hearing. People expressing an interest in this permit will be mailed an individual notice of hearing (WAC 173-220-100).

Comments should reference specific text followed by proposed modification or concern when possible. Comments may address technical issues, accuracy and completeness of information, the scope of the facility's proposed coverage, adequacy of environmental protection, permit conditions, or any other concern that would result from issuance of this permit.

The Department will consider all comments received within thirty (30) days from the date of public notice of draft indicated above, in formulating a final determination to issue, revise, or deny the permit. The Department's response to all significant comments is available upon request and will be mailed directly to people expressing an interest in this permit.

Further information may be obtained from the Department by telephone, 425-649-7201, or by writing to the address listed above.

This permit and fact sheet were written by Laura Fricke.

APPENDIX B—GLOSSARY

Acute Toxicity—The lethal effect of a pollutant on an organism that occurs within a short period of time, usually 48 to 96 hours.

AKART—An acronym for “all known available and reasonable methods of prevention, control, and treatment.”

Ambient Water Quality—The existing environmental condition of the water in a receiving water body.

Ammonia—Ammonia is produced by the breakdown of nitrogenous materials in waste water. Ammonia is toxic to aquatic organisms, exerts an oxygen demand, and contributes to eutrophication. It also increases the amount of chlorine needed to disinfect waste water.

Average Monthly Discharge Limitation—The highest allowable average of daily discharges over a calendar month, calculated as the sum of all daily discharges measured during a calendar month divided by the number of daily discharges measured during that month (except in the case of fecal coliform). The daily discharge is calculated as the average measurement of the pollutant over the day.

Average Weekly Discharge Limitation—The highest allowable average of daily discharges over a calendar week, calculated as the sum of all daily discharges measured during a calendar week divided by the number of daily discharges measured during that week. The daily discharge is calculated as the average measurement of the pollutant over the day.

Best Management Practices (BMPs)—Schedules of activities, prohibitions of practices, maintenance procedures, and other physical, structural and/or managerial practices to prevent or reduce the pollution of waters of the State. BMPs include treatment systems, operating procedures, and practices to control: plant site runoff, spillage or leaks, sludge or waste disposal, or drainage from raw material storage. BMPs may be further categorized as operational, source control, erosion and sediment control, and treatment BMPs.

BOD₅—Determining the Biochemical Oxygen Demand of an effluent is an indirect way of measuring the quantity of organic material present in an effluent that is utilized by bacteria. The BOD₅ is used in modeling to measure the reduction of dissolved oxygen in a receiving water after effluent is discharged. Stress caused by reduced dissolved oxygen levels makes organisms less competitive and less able to sustain their species in the aquatic environment. Although BOD is not a specific compound, it is defined as a conventional pollutant under the federal Clean Water Act.

Bypass—The intentional diversion of waste streams from any portion of a treatment facility.

CBOD₅—The quantity of oxygen utilized by a mixed population of microorganisms acting on the nutrients in the sample in an aerobic oxidation for five days at a controlled temperature of 20 degrees Celsius, with an inhibitory agent added to prevent the oxidation of nitrogen compounds. The method for determining CBOD₅ is given in 40 CFR Part 136.

Chlorine—Chlorine is used to disinfect waste waters of pathogens harmful to human health. It is also extremely toxic to aquatic life.

FACILITY NAME: GRANITE FALLS WWTP

Chronic Toxicity—The effect of a pollutant on an organism over a relatively long time, often 1/10 of an organism's lifespan or more. Chronic toxicity can measure survival, reproduction or growth rates, or other parameters to measure the toxic effects of a compound or combination of compounds.

Clean Water Act (CWA)—The Federal Water Pollution Control Act enacted by Public Law 92-500, as amended by Public Laws 95-217, 95-576, 96-483, 97-117; USC 1251 et seq.

Combined Sewer Overflow (CSO)—The event during which excess combined sewage flow caused by inflow is discharged from a combined sewer, rather than conveyed to the sewage treatment plant because either the capacity of the treatment plant or the combined sewer is exceeded.

Compliance Inspection - Without Sampling—A site visit for the purpose of determining the compliance of a facility with the terms and conditions of its permit or with applicable statutes and regulations.

Compliance Inspection - With Sampling—A site visit to accomplish the purpose of a Compliance Inspection - Without Sampling and as a minimum, sampling and analysis for all parameters with limits in the permit to ascertain compliance with those limits; and, for municipal facilities, sampling of influent to ascertain compliance with the percent removal requirement. Additional sampling may be conducted.

Composite Sample—A mixture of grab samples collected at the same sampling point at different times, formed either by continuous sampling or by mixing a minimum of four discrete samples. May be "time-composite" (collected at constant time intervals) or "flow-proportional" (collected either as a constant sample volume at time intervals proportional to stream flow, or collected by increasing the volume of each aliquot as the flow increased while maintaining a constant time interval between the aliquots).

Construction Activity—Clearing, grading, excavation, and any other activity which disturbs the surface of the land. Such activities may include road building; construction of residential houses, office buildings, or industrial buildings; and demolition activity.

Continuous Monitoring—Uninterrupted, unless otherwise noted in the permit.

Critical Condition—The time during which the combination of receiving water and waste discharge conditions have the highest potential for causing toxicity in the receiving water environment. This situation usually occurs when the flow within a water body is low, thus, its ability to dilute effluent is reduced.

Dilution Factor—A measure of the amount of mixing of effluent and receiving water that occurs at the boundary of the mixing zone. Expressed as the inverse of the effluent fraction e.g. a dilution factor of 10 means the effluent comprises 10% by volume and the receiving water 90%.

Engineering Report—A document which thoroughly examines the engineering and administrative aspects of a particular domestic or industrial wastewater facility. The report shall contain the appropriate information required in WAC 173-240-060 or 173-240-130.

FACILITY NAME: GRANITE FALLS WWTP

Fecal Coliform Bacteria—Fecal coliform bacteria are used as indicators of pathogenic bacteria in the effluent that are harmful to humans. Pathogenic bacteria in wastewater discharges are controlled by disinfecting the waste water. The presence of high numbers of fecal coliform bacteria in a water body can indicate the recent release of untreated waste water and/or the presence of animal feces.

Grab Sample—A single sample or measurement taken at a specific time or over as short a period of time as is feasible.

Industrial User—A discharger of waste water to the sanitary sewer which is not sanitary waste water or is not equivalent to sanitary waste water in character.

Industrial Wastewater—Water or liquid-carried waste from industrial or commercial processes, as distinct from domestic waste water. These wastes may result from any process or activity of industry, manufacture, trade or business; from the development of any natural resource; or from animal operations such as feed lots, poultry houses, or dairies. The term includes contaminated storm water and, also, leachate from solid waste facilities.

Infiltration and Inflow (I/I)—"Infiltration" means the addition of ground water into a sewer through joints, the sewer pipe material, cracks, and other defects. "Inflow" means the addition of precipitation-caused drainage from roof drains, yard drains, basement drains, street catch basins, etc., into a sewer.

Interference—A discharge which, alone or in conjunction with a discharge or discharges from other sources, both:

- Inhibits or disrupts the POTW, its treatment processes or operations, or its sludge processes, use or disposal and;
- Therefore is a cause of a violation of any requirement of the POTW's NPDES permit (including an increase in the magnitude or duration of a violation) or of the prevention of sewage sludge use or disposal in compliance with the following statutory provisions and regulations or permits issued thereunder (or more stringent State or local regulations): Section 405 of the Clean Water Act, the Solid Waste Disposal Act (SWDA) [including Title II, more commonly referred to as the Resource Conservation and Recovery Act (RCRA), and including State regulations contained in any State sludge management plan prepared pursuant to Subtitle D of the SWDA], sludge regulations appearing in 40 CFR Part 507, the Clean Air Act, the Toxic Substances Control Act, and the Marine Protection, Research and Sanctuaries Act.

Major Facility—A facility discharging to surface water with an EPA rating score of > 80 points based on such factors as flow volume, toxic pollutant potential, and public health impact.

Maximum Daily Discharge Limitation—The highest allowable daily discharge of a pollutant measured during a calendar day or any 24-hour period that reasonably represents the calendar day for purposes of sampling. The daily discharge is calculated as the average measurement of the pollutant over the day.

Method Detection Level (MDL)—The minimum concentration of a substance that can be measured and reported with 99% confidence that the analyte concentration is above zero and is determined from analysis of a sample in a given matrix containing the analyte.

Minor Facility—A facility discharging to surface water with an EPA rating score of < 80 points based on such factors as flow volume, toxic pollutant potential, and public health impact.

Mixing Zone—A volume that surrounds an effluent discharge within which water quality criteria may be exceeded. The area of the authorized mixing zone is specified in a facility's permit and follows procedures outlined in State regulations (Chapter 173-201A WAC).

National Pollutant Discharge Elimination System (NPDES)—The NPDES (Section 402 of the Clean Water Act) is the federal wastewater permitting system for discharges to navigable waters of the United States. Many states, including the State of Washington, have been delegated the authority to issue these permits. NPDES permits issued by Washington State permit writers are joint NPDES/State permits issued under both State and federal laws.

Pass-through—A discharge which exits the POTW into waters of the state in quantities or concentrations which, alone or in conjunction with a discharge or discharges from other sources, is a cause of a violation of any requirement of the POTW's NPDES permit (including an increase in the magnitude or duration of a violation), or which is a cause of a violation of State water quality standards.

pH—The pH of a liquid measures its acidity or alkalinity. A pH of 7 is defined as neutral, and large variations above or below this value are considered harmful to most aquatic life.

Potential Significant Industrial User—A potential significant industrial user is defined as an industrial user which does not meet the criteria for a significant industrial user, but which discharges waste water meeting one or more of the following criteria:

- a. Exceeds 0.5% of treatment plant design capacity criteria and discharges <25,000 gallons per day; or
- b. Is a member of a group of similar industrial users which, taken together, have the potential to cause pass-through or interference at the POTW (e.g. facilities which develop photographic film or paper, and car washes).

The Department may determine that a discharger initially classified as a potential significant industrial user should be managed as a significant industrial user.

Quantitation Level (QL)—A calculated value five times the MDL (method detection level).

Significant Industrial User (SIU)—

- 1) All industrial users subject to Categorical Pretreatment Standards under 40 CFR 403.6 and 40 CFR Chapter I, Subchapter N; and
- 2) Any other industrial user that: discharges an average of 25,000 gallons per day or more of process waste water to the POTW (excluding sanitary, noncontact cooling, and boiler blow-down waste water); contributes a process waste stream that makes up 5 percent or more of the average dry weather hydraulic or organic capacity of the POTW treatment plant; or is designated as such by the Control Authority* on the basis that the industrial user has a reasonable potential for adversely affecting the POTW's operation or for violating any pretreatment standard or requirement [in accordance with 40 CFR 403.8(f)(6)].

FACILITY NAME: GRANITE FALLS WWTP

Upon finding that the industrial user meeting the criteria in paragraph 2, above, has no reasonable potential for adversely affecting the POTW's operation or for violating any pretreatment standard or requirement, the Control Authority* may at any time, on its own initiative or in response to a petition received from an industrial user or POTW, and in accordance with 40 CFR 403.8(f)(6), determine that such industrial user is not a significant industrial user.

*The term "Control Authority" refers to the Washington State Department of Ecology in the case of nondelegated POTWs or to the POTW in the case of delegated POTWs.

State Waters—Lakes, rivers, ponds, streams, inland waters, underground waters, salt waters, wetlands, and all other surface waters and watercourses within the jurisdiction of the state of Washington.

Stormwater—That portion of precipitation that does not naturally percolate into the ground or evaporate, but flows via overland flow, interflow, pipes, and other features of a stormwater drainage system into a defined surface water body, or a constructed infiltration facility.

Technology-based Effluent Limit—A permit limit that is based on the ability of a treatment method to reduce the pollutant.

Total Suspended Solids (TSS)—Total suspended solids are the particulate materials in an effluent. Large quantities of TSS discharged to a receiving water may result in solids accumulation. Apart from any toxic effects attributable to substances leached out by water, suspended solids may kill fish, shellfish, and other aquatic organisms by causing abrasive injuries and by clogging the gills and respiratory passages of various aquatic fauna. Indirectly, suspended solids can screen out light and can promote and maintain the development of noxious conditions through oxygen depletion.

Upset—An exceptional incident in which there is unintentional and temporary noncompliance with technology-based permit effluent limitations because of factors beyond the reasonable control of the Permittee. An upset does not include noncompliance to the extent caused by operational error, improperly designed treatment facilities, lack of preventative maintenance, or careless or improper operation.

Water Quality-based Effluent Limit—A limit on the concentration or mass of an effluent parameter that is intended to prevent the concentration of that parameter from exceeding its water quality criterion after it is discharged into a receiving water.

APPENDIX C—TECHNICAL CALCULATIONS

Several of the Excel® spreadsheet tools used to evaluate a discharger's ability to meet Washington State water quality standards can be found on the Department's homepage at (<http://www.ecy.wa.gov/programs/wq/wastewater/index.html>).

FACILITY NAME: GRANITE FALLS WWTP

APPLICABLE WATER QUALITY CRITERIA

FILENAME: Granite Falls tsdcalc11.xls

FACILITY: GRANITE FALLS WWTP

RUN DATE: 7/1/2004

PREPARED BY: LAURA FRICKE

WATER QUALITY CRITERIA (in µg/L unless otherwise noted)

Pollutant	Priority Pollutant?	Carcinogen?	<u>Water Quality Criteria</u> Fresh		<u>Human Health</u> <u>Criteria</u> Fresh	<u>Metals Translators</u> <u>Freshwater</u>	
			Acute	Chronic		Acute	Chronic
AMMONIA unionized -see separate spreadsheets for FW criteria	N	N					
ARSENIC (dissolved)	Y	Y	360	190		1.00	1.00
ARSENIC (inorganic)	Y	Y			0.018		
CADMIUM - Hardness dependent	Y	N	1.22	0.48		0.943	0.943
CHROMIUM(TRI) - Hardness dependent	N	N	237.67	77.10			
COPPER - Hardness dependent	Y	N	6.50	4.74		0.996	0.996
LEAD – Hardness dependent	Y	N	20.90	0.81		0.466	0.466
MERCURY	Y	N	2.10	0.012	0.14	0.85	
NICKEL – Hardness dependent	Y	N	596.37	66.23	610	0.998	0.997
SILVER – Hardness dependent	Y	N	0.60	NA		0.85	
ZINC- Hardness dependent	Y	N	48.16	43.97		0.996	0.996

Hardness value used for hardness
dependent limits = 36 mg/L

FACILITY NAME: GRANITE FALLS WWTP

AMMONIA WATER QUALITY CRITERIA CALCULATION

FILENAME: Granite Falls tsdcalc11.xls

DATE: 7/1/2004

INPUT

1. Ambient Temperature (deg C; 0<T<30)	17.4
2. Ambient pH (6.5<pH<9.0)	7.40
3. Acute TCAP (Salmonids present- 20; absent- 25)	20
4. Chronic TCAP (Salmonids present- 15; absent- 20)	15

OUTPUT

1. Intermediate Calculations:

Acute FT	1.20
Chronic FT	1.41
FPH	1.60
RATIO	20
pKa	9.48
Fraction Of Total Ammonia Present As Un-ionized	0.8169%

2. Un-ionized Ammonia Criteria

Acute (1-hour) Un-ionized Ammonia Criterion (ug NH3/L)	135.8
Chronic (4-day) Un-ionized Ammonia Criterion (ug NH3/L)	17.5

3. Total Ammonia Criteria:

Acute Total Ammonia Criterion (mg NH3+ NH4/L)	16.6
Chronic Total Ammonia Criterion (mg NH3+ NH4/L)	2.1

4. Total Ammonia Criteria expressed as Nitrogen:

Acute Ammonia Criterion as mg N	13.7
Chronic Ammonia Criterion as N	1.76

FACILITY NAME: GRANITE FALLS WWTP

RECEIVING WATER SAMPLE RESULTS DURING CRITICAL CONDITIONSSample results from *City of Granite Falls Effluent and Receiving Water Study*, April 2004

Values in µg/L

	Arsenic (dissolved)	Arsenic (total)	Cadmium (dissolved)	Cadmium (total)	Chromium (dissolved)	Chromium (total)	Copper (dissolved)	Copper (total)	Lead (dissolved)	Lead (total)	Mercury	Nickel (total)	Silver (dissolved)	Silver (total)	Zinc (dissolved)	Zinc (total)
8/20/2003		1.10	<0.05	<0.05	0.50	0.80	0.53	0.60	0.00	0.00	0.0000	1.70	<0.02	<0.02	<0.5	<0.5
10/8/2003	1.10	1.10	<0.02	<0.02	0.90	0.80	0.39	0.42	0.03	0.04	0.0012	1.40	<0.02	<0.02	<0.5	<0.7
Mean	1.10	1.10			0.70	0.80	0.46	0.51	0.02	0.02	0.0006	1.55				
Geometric Mean	1.10				0.67		0.45		N/A		N/A	1.54				
Background value	1.91				1.17		0.79		0.03		0.0010	2.68				
Translator					N/A		0.90		0.75		N/A	N/A				

Background value is the geometric mean multiplied by 1.74. This estimates the 90th percentile of a lognormal distribution with a CV of 0.6 (Gilbert 1987).

Where data are available the translator value can be calculated from the dissolved to total recoverable ratio.

	Hardness (as mg/L CaCO ₃)	TSS (mg/L)	pH	D.O. (mg/L)	Temperature (deg. C)	Flow (cfs)
8/20/2003	36.7	<5	7.4	15.8	17.4	27
10/8/2003	35.8	<5	7.27	10.6	11.7	39

REASONABLE POTENTIAL CALCULATION

Granite Falls tsdcalc11.xls
7/1/2004

Parameter	Metal Criteria		Ambient Concentration (metals as dissolved) <i>ug/L</i>	State Water Quality Standard		Max concentration at edge of...		LIMIT REQ'D?	Effluent percentile value	Max effluent conc. measured (metals as total recoverable)		Coeff Variation <i>CV</i>	# of samples <i>s</i>	<i>n</i>	Multiplier	Acute Dil'n Factor	Chronic Dil'n Factor
	Translator as decimal	Translator as decimal		Acute	Chronic	Acute Mixing Zone	Chronic Mixing Zone			<i>Pn</i>	<i>ug/L</i>						
	<i>Acute</i>	<i>Chronic</i>		<i>ug/L</i>	<i>ug/L</i>	<i>ug/L</i>	<i>ug/L</i>										
AMMONIA				13700	1760	1319.73	505.79	NO	0.95	0.950	20000.00	0.91	0.78	59	1.00	15.1	39.4
ARSENIC (dissolved)	1.000	1.000	1.9100	360	190	1.94	1.92	NO	0.95	0.607	1.10	0.60	0.55	6	2.14	15.1	39.4
CADMIUM	0.943	0.943		1.2200	0.4800	0.00	0.00	NO	0.95	0.950	0.07	9.60	2.13	59	1.00	15.1	39.4
CHROMIUM(TRI)			1.1700	237.6700	77.1000	1.28	1.21	NO	0.95	0.607	1.30	0.60	0.55	6	2.14	15.1	39.4
COPPER	0.900	0.900	0.7900	6.5000	4.7400	1.68	1.13	NO	0.95	0.950	15.96	1.00	0.83	59	1.00	15.1	39.4
LEAD	0.750	0.750	0.0300	20.9000	0.8100	0.10	0.06	NO	0.95	0.607	0.64	0.60	0.55	6	2.14	15.1	39.4
MERCURY	0.850		0.0010	2.1000	0.0120	0.00	0.00	NO	0.95	0.950	0.0012	9.50	2.12	59	1.00	15.1	39.4
NICKEL	0.998	0.997	2.6800	596.3700	66.2300	2.94	2.78	NO	0.95	0.607	3.10	0.60	0.55	6	2.14	15.1	39.4
SILVER	0.850			0.6000	1.0000	0.02	0.01	NO	0.95	0.607	0.18	0.60	0.55	6	2.14	15.1	39.4
ZINC	0.996	0.996		48.1600	43.9700	5.37	2.06	NO	0.95	0.950	81.55	0.47	0.45	59.00	1.00	15.1	39.4

FACILITY NAME: GRANITE FALLS WWTP

REASONABLE POTENTIAL CALCULATION FOR HUMAN HEALTH CRITERIA

Granite Falls tsdcalc11.xls

7/1/2004

Revised 3/00

Parameter	Ambient Concentration (Geometric Mean)	Water Quality Criteria for Protection of Human Health	Max concentrati on at edge of chronic mixing zone.	LIMIT REQ'D?	Expected Number of Compliance Samples per Month	AVERAGE MONTHLY EFFLUENT LIMIT	MAXIMUM DAILY EFFLUENT LIMIT	Estimatec Percentile : 95% Confidenc		Max effluent conc. measured	Coeff Variation	S	# of samples from which # in col. K was taken n	Multiplier	Dilution Factor
	ug/L	ug/L	ug/L			ug/L	ug/L	Pn		ug/L	CV				
ARSENIC	1.1	1.1	1.1	NO	1.00	NONE	NONE	0.50	0.61	1.10	0.60	0.6	6	0.86	39.4
MERCURY	0.0010	0.14	0.03	NO	1.00	NONE	NONE	0.50	0.61	1.18	0.60	0.6	6	0.86	39.4
NICKEL - Dependent on hardness	2.6800	610.00	2.68	NO	1.00	NONE	NONE	0.50	0.61	3.10	0.60	0.6	6	0.86	39.4

CALCULATION OF pH OF A MIXTURE OF TWO FLOWS.

Based on the procedure in EPA's DESCON program (EPA, 1988. Technical Guidance on Supplementary Stream Design Conditions for Steady State Modeling. USEPA Office of Water, Washington D.C.)

Based on Lotus File PHMIX2.WK1 Revised 19-Oct-93

INPUT

1. DILUTION FACTOR AT MIXING ZONE BOUNDARY	39.400
1. UPSTREAM/BACKGROUND CHARACTERISTICS	
Temperature (deg C):	17.40
pH:	7.40
Alkalinity (mg CaCO3/L):	50.00
2. EFFLUENT CHARACTERISTICS	
Temperature (deg C):	28.00
pH:	7.60
Alkalinity (mg CaCO3/L):	150.00

OUTPUT

1. IONIZATION CONSTANTS	
Upstream/Background pKa:	6.40
Effluent pKa:	6.33
2. IONIZATION FRACTIONS	
Upstream/Background Ionization Fraction:	0.91
Effluent Ionization Fraction:	0.95
3. TOTAL INORGANIC CARBON	
Upstream/Background Total Inorganic Carbon (mg CaCO3/L):	55.01
Effluent Total Inorganic Carbon (mg CaCO3/L):	158.12
4. CONDITIONS AT MIXING ZONE BOUNDARY	
Temperature (deg C):	17.67
Alkalinity (mg CaCO3/L):	52.54
Total Inorganic Carbon (mg CaCO3/L):	57.63
pKa:	6.40
pH at Mixing Zone Boundary:	7.41

EFFLUENT DATA SUMMARY STATISTICS - AMMONIA

<i>Ammonia Statistics</i>	
Mean	8.426111111
Standard Error	1.277950686
Median	6.9
Mode	13.4
Standard Deviation	7.667704118
Sample Variance	58.79368644
Kurtosis	-1.196150591
Skewness	0.44857628
Range	24.59
Minimum	0.11
Maximum	24.7
Sum	303.34
Count	36
CV	0.909993236
95th percentile	19.975

EFFLUENT DATA SUMMARY STATISTICS - CADMIUM

<i>Cadmium Statistics</i>	
Mean	0.09212766
Standard Error	0.07440087
Median	0
Mode	0
Standard Deviation	0.883461381
Sample Variance	0.780504012
Kurtosis	135.1260841
Skewness	11.52689235
Range	10.4
Minimum	0
Maximum	10.4
Sum	12.99
Count	141
CV	9.589534623
95th percentile	0.07

EFFLUENT DATA SUMMARY STATISTICS - COPPER

<i>Copper Statistics</i>	
Mean	7.16990991
Standard Error	0.480553313
Median	5.44
Mode	10.3
Standard Deviation	7.160083103
Sample Variance	51.26679004
Kurtosis	51.71586666
Skewness	6.166539354
Range	79.6
Minimum	0
Maximum	79.6
Sum	1591.72
Count	222
CV	0.998629438
95th percentile	15.955

EFFLUENT DATA SUMMARY STATISTICS - MERCURY

<i>Mercury Statistics</i>	
Mean	0.010752899
Standard Error	0.008693038
Median	0
Mode	0
Standard Deviation	0.102120074
Sample Variance	0.01042851
Kurtosis	128.1444297
Skewness	11.18477033
Range	1.18
Minimum	0
Maximum	1.18
Sum	1.4839
Count	138
CV	9.496981073
95th percentile	0.001185

EFFLUENT DATA SUMMARY STATISTICS - ZINC

<i>Zinc Statistics</i>	
Mean	53.77545455
Standard Error	1.702030308
Median	49.65
Mode	37.2
Standard Deviation	25.24518919
Sample Variance	637.3195774
Kurtosis	27.16549064
Skewness	4.301718344
Range	236
Minimum	21
Maximum	257
Sum	11830.6
Count	220
CV	0.469455617
95th percentile	81.55

EFFLUENT DATA – OTHER METALS

	Arsenic	Chromium	Lead	Nickel	Silver
8/20/2003	1.10	1.30	0.47	2.20	0.16
8/22/2003	1.10	1.10	0.64	3.10	0.16
8/25/2003	1.00	1.00	0.50	3.10	0.09
2/18/2004	0.60	1.30	0.51	1.60	0.16
2/20/2004	0.00	0.70	0.26	1.40	0.18
2/23/2004	0.00	1.10	0.26	1.40	0.11
highest	1.10	1.30	0.64	3.10	0.18
MEC	2.31	2.73	1.34	6.51	0.38

assume CV=0.6
 number of data points = 6
 multiplier (from TSD) = 2.1

WHOLE EFFLUENT TOXICITY TEST RESULTS

Granite Falls WWTP Chronic WET Test Results as NOEC/LOEC in % Effluent

Test #	Sample Date	Start Date	Lab	Organism	Endpoint	NOEC	LOEC	MSDp
RMAR 201	8/20/2003 12:00	8/21/2003 12:55	AMEC	<i>Ceriodaphnia dubia</i>	7-day Survival Reproduction	100 59	> 100 100	17.41%
RMAR 202	8/20/2003 12:00	8/21/2003 11:15	AMEC	fathead minnow	7-day Survival Biomass Weight	100 100 100	> 100 > 100 > 100	5.60% 12.19% 12.72%
RMAR 199	2/18/2004 11:00	2/19/2004 15:00	AMEC	<i>Ceriodaphnia dubia</i>	7-day Survival Reproduction	100 100	> 100 > 100	18.09%
RMAR 200	2/18/2004 11:00	2/19/2004 13:15	AMEC	fathead minnow	7-day Survival Biomass Weight	100 100 100	> 100 > 100 > 100	3.79% 17.61% 17.64%

Granite Falls WWTP Acute WET Test Results as % Survival in 100% Effluent

Test #	Sample Date	Start Date	Lab	Title	Organism	Endpoint	% Survival
RMAR 204	8/25/2003 11:00	8/26/2003 13:45	AMEC	Acute Daphnid Survival Test	<i>Ceriodaphnia dubia</i>	48-hour Survival	100.0%
RMAR 203	8/25/2003 11:00	8/26/2003 12:45	AMEC	Acute Fish Survival Test	fathead minnow	96-hour Survival	82.5%
RMAR 197	2/18/2004 11:00	2/19/2004 16:00	AMEC	Acute Daphnid Survival Test	<i>Ceriodaphnia dubia</i>	48-hour Survival	100.0%
RMAR 198	2/18/2004 11:00	2/19/2004 14:00	AMEC	Acute Fish Survival Test	fathead minnow	96-hour Survival	100.0%

Granite Falls WWTP Acute WET Test Results as NOEC/LOEC in % Effluent

Test #	Sample Date	Start Date	Lab	Title	Organism	Endpoint	NOEC	LOEC	MSDp
RMAR 204	8/25/2003 11:00	8/26/2003 13:45	AMEC	Acute Daphnid Survival Test	<i>Ceriodaphnia dubia</i>	48-hour Survival	100	> 100	5.00%
RMAR 203	8/25/2003 11:00	8/26/2003 12:45	AMEC	Acute Fish Survival Test	fathead minnow	96-hour Survival	100	> 100	14.44%
RMAR 197	2/18/2004 11:00	2/19/2004 16:00	AMEC	Acute Daphnid Survival Test	<i>Ceriodaphnia dubia</i>	48-hour Survival	100	> 100	7.50%
RMAR 198	2/18/2004 11:00	2/19/2004 14:00	AMEC	Acute Fish Survival Test	fathead minnow	96-hour Survival	100	> 100	10.52%

APPENDIX D—RESPONSE TO COMMENTS